Condensing Heat Exchanger Kit

Cancels: IIK 398A-40-2 IIK 398A-40-27
3-15-92

Installation Instructions
Part No. 312731-755 through -761

NOTE: Read the entire instruction before starting the installation.

INTRODUCTION

This instruction covers installation of a polypropylene-laminated (PPL) steel condensing heat exchanger and collector box assembly kit in an upflow condensing furnace. See Table 1 for furnace and kit combinations.

NOTE: If this kit is used to replace a stainless steel condensing heat exchanger in a Model 398A, Series B through F, or a 58SX, Series 110 through 180 Furnace, some modifications to the vent system or unit may be necessary. Refer to Step 6—Replacing a stainless steel condensing heat exchanger with a PPL condensing heat exchanger.

NOTE: Obtain a releasing agent (Pam or equivalent) and RTV sealant (G.E. 122, 162, or Dow-Corning 738) before starting the installation.

SAFETY CONSIDERATIONS

Installation and service of heating equipment can be hazardous due to gas and electrical components. Only trained personnel should install or service heating equipment.

Untrained personnel can perform basic maintenance functions such as cleaning and replacing filters. All other operations should be performed by trained service personnel. When working on heating equipment, observe precautions in literature, and on tags and labels attached to the unit.

Follow all safety codes. Wear safety glasses and work gloves. Have a fire extinguisher available.

⚠ WARNING

Before beginning any installation or modification, be sure the main electrical disconnect switch is in the OFF position. Electrical shock can cause personal injury or death.

DESCRIPTION AND USAGE

This kit contains the following items:

Condensing heat exchanger assembly (includes collector box)	(1)
Inducer inlet gasket	(1)
Stainless steel screws (in bag)	(max 12)
Limit switch (in 312731-758 and -759 kits only)	(1)
Limit shield (in 312731-758 kit only)	(1)
Installation Instructions	(1)

Table 1—Kit Usage

KIT PART NO.	FURNACE MODEL & SIZE		
	398A	58SX/SXA/SXC	320A/398B/ 58SXB/58VUA
312731-755	030040	040-FG or BC	—
312731-756	036040	040-GG or CC	—
312731-761	036060	060-GG or CC	—
312731-757	—	—	060
312731-758	036080	080-GG or BC	080
	048080	080-JG or CC	080
312731-759	048100	100-JG or CC	100
	060100	100-LG or DC	100
312731-760	060120	120-LG or CC	—

Step 1—Removal of Inducer Assembly

1. Turn OFF gas and electrical supplies to furnace.
2. Remove blower and control access doors.
3. Loosen hose clamp at vent pipe connection; disconnect vent pipe. Position vent pipe out of way.
4. Disconnect electrical connector from inducer control box (if used) and disconnect wires from pressure switch.
5. Disconnect inducer motor leads.
6. Disconnect edge connector from main control box at blower shelf.
7. Remove screws securing main control box to blower shelf and lay control box in bottom of furnace.
8. Loosen hose clamp and remove drain tube from bottom of inducer housing (bottom side of blower shelf).
9. Loosen hose clamp, at pressure switch, on pressure tube from plastic tee. Remove tube from pressure switch.
10. Loosen hose clamp, at collector box, on tube from pressure switch. Remove tube from collector box.
11. Loosen hose clamp, at collector box, on drain tube from inducer outlet elbow. Remove tube from collector box.
12. Remove and discard mounting screws securing inducer assembly (motor, pressure switch, inducer housing, mounting bracket, and inducer outlet elbow). Remove inducer assembly from furnace. When necessary, remove screw securing motor ground wire to blower shelf.
13. Remove inducer controller (if used) on left side of casing.

Step 2—Removal of Condensing Heat Exchanger and Collector Box Assembly

1. Loosen hose clamp on 7/8-in. OD drain tube at collector box; remove tube.
2. Pull drain tube down into blower compartment.
3. Remove drain tube grommet from blower shelf.
4. Remove screw securing wire harness to blower shelf.

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5. Remove screws securing coupling box (box with thick insulation) to cell panel and condensing heat exchanger. Do not remove screws through insulation.
6. Using a screwdriver blade, break seal between coupling box and cell panel. Remove coupling box from furnace.
7. Remove screws securing condensing heat exchanger to cell panel and cell panel supports.
8. Remove choke plate (when used).
9. Using screwdriver blade, break seal between top flange of condensing heat exchanger and bottom edge of cell panel.
10. Position edge connectors and pressure tube so that condensing heat exchanger will clear; remove heat exchanger through front of furnace.

Step 3—Installation of New Condensing Heat Exchanger and Collector Box Assembly

1. Clean old sealant and gasket from blower shelf flange.
2. Check sides and bottom of end panel on new heat exchanger assembly for foam tape air gasket. If any pieces are loose, reattach them. (See Fig. 1.)
3. Check end panel top flange on new heat exchanger assembly for rubber seal—ensure it is positioned properly. (See Fig. 1.)
4. Install condensing heat exchanger in furnace. Use new 1/2-in. stainless steel screws (provided in kit) across top of condensing heat exchanger.
5. Install choke plate (when used). Ensure choke plate bottom conforms to condensing heat exchanger top flange.
6. Reinstall grommet in hole in blower shelf for 7/8-in. OD drain tube.
7. Pull 7/8-in. OD drain tube through grommet and connect to collector box.

Step 4—Reinstall Coupling Box

1. Clean old sealant from cell panel and coupling box.
2. Apply sealant releasing agent (Pam or equivalent) to flange surface where old sealant was removed. (See Fig. 2.)
3. After applying releasing agent, apply 1/4-in. bead of G.E. RTV 122, 162, or Dow-Corning RTV 738 sealant to coupling box flange over releasing agent. (See Fig. 2.)
4. Position coupling box so slot in insulation is on left side and install coupling box. Keep coupling box movement to a minimum to prevent spreading sealant. Ensure all screws are tight.

Step 5—Reinstall Inducer Assembly

1. Epoxy-coated steel housing:
   a. Remove old inlet gasket from backside of housing.
   b. Install new inlet gasket provided in kit on backside of housing.
2. Plastic housing:
   a. Remove old sealant from backside of housing.
   b. Apply releasing agent (Pam) to area surrounding outlet of collector box.
   c. Apply 1/8- to 3/16-in. diameter continuous bead of RTV sealant to backside of housing. (See Fig. 3.) Sealant must not set more than 10 minutes prior to installation.
3. With gasket on drain port in bottom of inducer housing, position inducer assembly in furnace. Ensure drain port extends through blower shelf.

NOTE: Keep inducer assembly movement to a minimum to prevent spreading sealant.

4. Using new 1/2-in. stainless steel screws (provided in kit), secure inducer assembly to coupling and collector boxes. The plastic housing requires 4 screws in the collector box and 1 in the coupling box. The metal housing requires 3 screws in the collector box and 1 in the coupling box. When applicable, plug the fourth mounting screw hole with a stainless steel screw. (The hole is located in the collector box, below the mounting screw on the right side of housing, just above and to the left of the collector box drain ports.)
5. Connect drain tube from inducer outlet box to collector box. (Connect to port nearest 7/8-in. OD tube.)
6. Connect pressure tube from front port or port marked ‘‘collector box’’ on pressure switch to collector box.
7. Connect pressure tube from plastic tee to back port, or port marked ‘‘burner enclosure,’’ on pressure switch.
8. Reconnect electrical connector to inducer control box (if used) and reconnect wires to pressure switch per wiring label on control door.
9. Reconnect inducer motor leads.
10. Connect drain tube from top of trap to bottom of inducer housing (under blower shelf).
11. Reinstall inducer controller (if used) on left side of casing.
12. Reinstall control box on blower shelf.
13. Reconnect edge connector to main control box on blower shelf.
14. Secure wire harness to blower shelf. When applicable, secure inducer motor ground wire to blower shelf.
15. Reconnect vent pipe; ensure clamp is tight.
16. Replace blower access door.

Step 6—Replacement of a Stainless Steel Condensing Heat Exchanger with PPL Condensing Heat Exchanger

NOTE: When replacing a stainless steel condensing heat exchanger in a 398B/58SXB Furnace with a PPL condensing heat exchanger, no additional modifications to the furnace are necessary—proceed to Step 7.

Inspect the heat exchanger removed from the furnace. The cells of a stainless steel condensing heat exchanger will be metallic on the inside and outside. The cells of a PPL steel condensing heat exchanger will have a white laminate on the inside and an off-brown color on the outside. When replacing a PPL condensing heat exchanger with a PPL condensing heat exchanger, no additional modifications to the furnace are necessary—proceed to Step 7.

However, when replacing a stainless steel condensing heat exchanger in a Model 398A, Series B through F, or 58SX, Series 110 through 180 Furnace with a PPL condensing heat exchanger, proceed as follows for possible modifications to the furnace or combustion-air and vent piping:

1. Individually measure length and count number of elbows in combustion-air vent pipe.
2. Using Table 3, verify that both pipes are properly sized within required limits. If pipe length and diameter are acceptable, proceed to item 3. If pipes do not meet Table 3 requirements, perform following test to determine if piping modifications are necessary:

NOTE: Perform this test before starting the furnace for the first time (after replacement of condensing heat exchanger). Firing the furnace before the test will cause condensate in the condensing heat exchanger and give incorrect results.

a. Loosen tube clamps and remove 5/8-in. and 7/8-in. drain tubes from condensate trap.

b. Using backup wrench, disconnect condensate drain pipe at coupling.

c. Loosen screws securing trap bracket and remove trap.

d. Drain all condensate from trap.

e. Reinstall trap and connect tubing and drain pipe. (Use backup wrench on drain pipe.)

f. Reinstall blower access door.

g. Turn ON gas and electrical supplies.

h. Start furnace. If main burners fire, no modifications to the combustion-air or vent pipes are necessary—proceed to item 3. However, if inducer motor starts, but pressure switch normally-open contacts do not close, proceed as follows:

i. Turn Off gas and electrical supplies.

j. Loosen clamps on neoprene rubber coupling securing combustion-air pipe to top of furnace.

k. Remove combustion-air pipe and neoprene rubber coupling from furnace.

l. Remove perforated disc from neoprene rubber coupling. **DO NOT** remove perforated disc installed in the burner enclosure top.

m. Reinstall neoprene rubber coupling and combustion-air pipe.

n. Turn ON gas and electrical supplies.

o. Start furnace. If main burners fire, no additional modifications to the combustion-air or vent pipes are necessary. Proceed to Step 3. However, if pressure switch normally-open contacts do not close, or furnace starts but produces a noise due to resonance in primary heat exchanger/combustion-air piping system, replace perforated disc removed earlier. Modifications to combustion-air and vent pipes must be made to meet requirements in Table 3.

3. No other furnace modifications are required when replacing stainless steel condensing heat exchangers in Model 398A or 398B sizes 030040, 036040, 036060, 036080, 048100, or 060120; also, no other modifications are required in Model 58SX or 58SXB sizes 040-BC, 040-CC, 060-CC, or 080-BC, 100- CC, or 120-CC Furnaces.
   When replacing a stainless steel condensing heat exchanger in a Model 398A048080 or 060100 and Model 58SX-080-CC or 100-DC Furnaces refer to Table 2 for limit switch and shield changes. The required limit switch and/or shield are provided in the kit.

Table 2—Limit Switch/Shield Requirements

FURNACE SIZE		LIMIT SWITCH PART NO.	LIMIT SHIELD PART NO.
398A	58SX		
048080	080-CC	HH12ZA189 (190° F)	302615-102
060100	100-DC	HH12ZA174 (170° F)	—

Step 7—Check Operation

1. Turn ON gas and electrical supplies.
2. Check furnace operation through 2 complete operating cycles.
3. Check for condensate leaks.
4. Replace control access door.

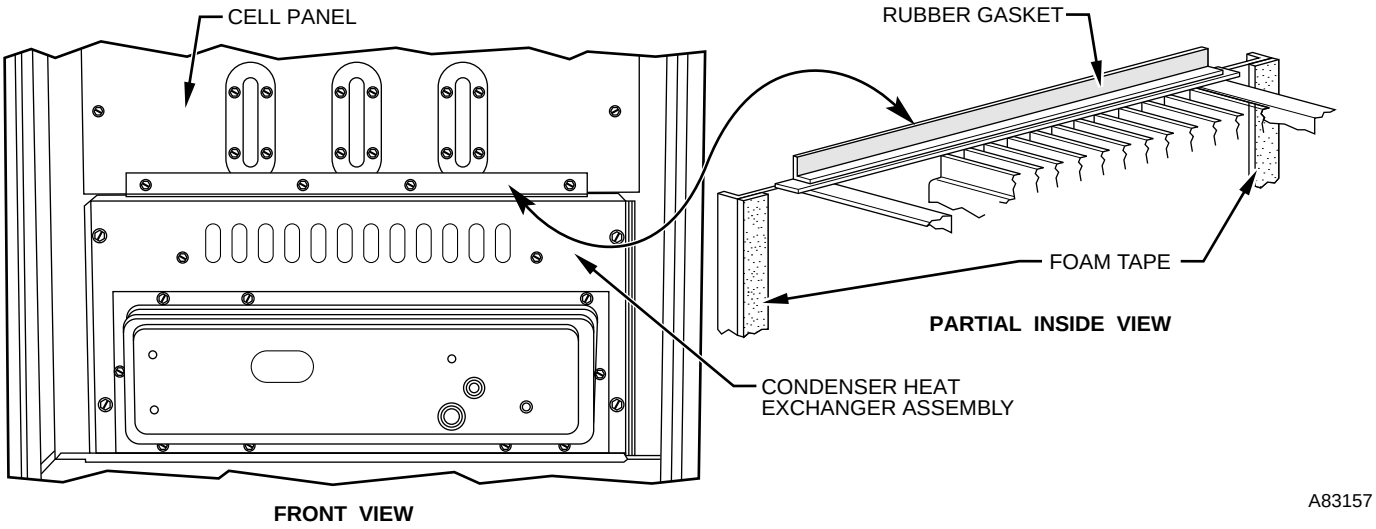

Fig. 1—Front View of Condensing Heat Exchanger Assembly

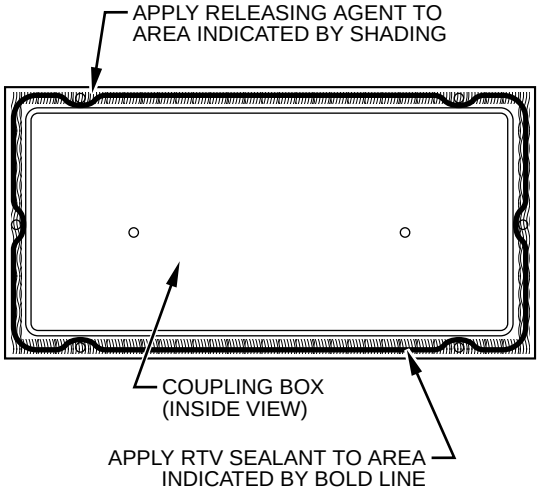

Fig. 2—Inside View of Coupling Box

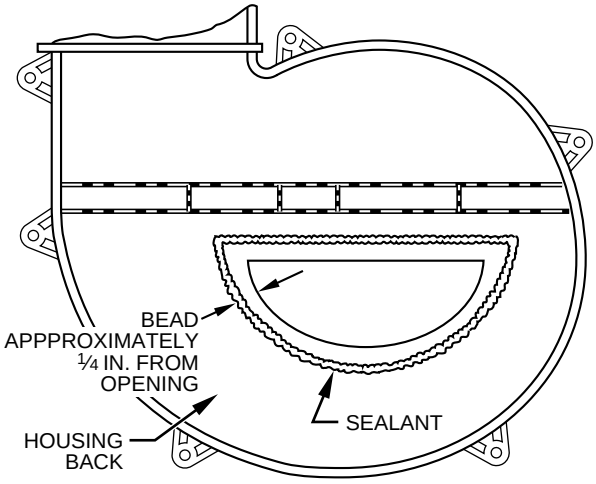

Fig. 3—Backside of Inducer Assembly Housing

Table 3—Maximum Allowable Pipe Length (Ft)

ALTITUDE (FT ABOVE SEA LEVEL)	FURNACE SIZE	PIPE SIZE (IN.)	NUMBER OF 90° ELBOWS 1	2	3	4	5	6
0 to 2000	030040/040-FG	2	35	35	35	35	35	0
	036040/040-GG	1-1/2	20	15	10	0	0	0
		2	70	70	70	70	70	65
	036060/060-GG	1-1/2	10	10	5	0	0	0
		2	50	50	45	45	40	40
		2-1/2	70	70	70	70	70	70
	036080 & 048080/ 080-GG & JG	2*†	10	10	0	0	0	0
		2-1/2	50	45	35	30	25	15
		3	70	70	70	70	70	70
	048100 & 060100/ 100-JG & LG	2-1/2	20	15	5	0	0	0
		3	65	65	60	55	50	45
		4	70	70	70	70	70	70
	060120/120-LG	3†	35	30	30	25	20	15
		3*†	35	35	35	35	35	35
		4	60	60	60	60	50	50
		4*	70	70	70	70	70	70
2001 to 3000	030040/040-FG	2	31	30	30	29	29	0
	036040/040-GG	1-1/2	17	12	7	0	0	0
		2	62	61	61	60	60	55
	036060/060-GG	1-1/2	8	7	0	0	0	0
		2	44	43	39	38	33	32
		2-1/2	62	61	61	60	60	59
	036080 & 048080/ 080-GG & JG	2-1/2	44	39	30	24	20	10
		3	62	61	61	60	60	59
	048100 & 060100/ 100-JG & LG	2-1/2	17	12	0	0	0	0
		3	58	57	52	47	42	37
		4	62	61	61	60	60	59
	060120/120-LG	3†	31	25	25	20	15	10
		3*†	31	30	30	29	29	28
		4	53	52	52	51	42	41
		4*	62	61	61	60	60	59
3001 to 4001	030040/040-FG	2	28	27	26	25	24	0
	036040/040-GG	1-1/2	15	10	0	0	0	0
		2	57	56	55	54	53	49
	036060/060-GG	1-1/2	6	5	0	0	0	0
		2	43	39	35	34	28	27
		2-1/2	57	56	55	54	53	52
	036080 & 048080/ 080-GG & JG	2-1/2	40	36	26	20	16	0
		3	57	56	55	54	53	52
	048100 & 060100/ 100-JG & LG	2-1/2	15	10	0	0	0	0
		3	54	53	47	42	36	32
		4	57	56	55	54	53	52
	060120/120-LG	3†	28	22	21	17	11	6
		3*†	28	27	26	25	24	23
		4	49	48	47	46	36	35
		4*	57	56	55	54	53	52
4001 to 5000	030040/040-FG	2	26	25	24	23	22	0
	036040/040-GG	1-1/2	13	9	0	0	0	0
		2	53	52	51	50	49	45
	036060/060-GG	1-1/2	5	0	0	0	0	0
		2	37	36	32	31	25	24
		2-1/2	53	52	51	50	49	48
	036080 & 048080/ 080-GG & JG	2-1/2	37	33	24	18	14	0
		3	53	52	51	50	49	48
	048100 & 060100/ 100-GG & LG	2-1/2	13	9	0	0	0	0
		3	50	49	43	39	33	29
		4	53	52	51	50	49	48
	060120/120-LG	3†	26	20	19	15	9	0
		3*†	26	25	24	23	22	21
		4	45	44	43	42	33	32
		4*	53	52	51	50	49	48
5001 to 6000	030040/040-FG	2	24	22	21	19	18	0
	036040/040-GG	1-1/2	11	7	0	0	0	0
		2	49	47	46	44	43	39
	036060/060-GG	2	34	32	28	27	20	19
		2-1/2	49	47	46	44	43	41
	036080 & 048080/ 080-GG & JG	2-1/2	34	30	21	14	10	0
		3	49	47	46	44	43	41
	048100 & 060100/ 100-JG & LG	2-1/2	11	7	0	0	0	0
		3	46	45	38	34	28	24
		4	49	47	46	44	43	41
	060120/120-LG	3†	24	17	16	12	5	0
		3*†	24	22	21	19	18	16
		4	41	40	38	37	28	26
		4*	49	47	46	44	43	41

ALTITUDE (FT ABOVE SEA LEVEL)	FURNACE SIZE	PIPE SIZE (IN.)	NUMBER OF 90° ELBOWS 1	2	3	4	5	6
6001 to 7000	030040/040-FG	2	22	20	19	17	16	0
	036040/040-GG	1-1/2	10	6	0	0	0	0
		2	45	43	42	40	39	35
	036060/060-GG	2	31	29	26	24	18	16
		2-1/2	45	43	42	40	39	37
	036080 & 048080/ 080-GG & JG	2-1/2	31	27	19	12	0	0
		3	45	43	42	40	39	37
	048100 & 060100/ 100-JG & LG	2-1/2	10	6	0	0	0	0
		3	43	41	35	31	25	21
		4	45	43	42	40	39	37
	060120/120-LG	3†	22	15	14	10	0	0
		3*†	22	20	19	17	16	14
		4	38	36	35	33	25	23
		4*	45	43	42	40	39	37
7001 to 8000	030040/040-FG	2	19	17	15	13	11	0
	036040/040-GG	1-1/2	8	0	0	0	0	0
		2	41	39	37	35	33	29
	036060/060-GG	2	27	25	22	20	13	11
		2-1/2	41	39	37	35	33	31
	036080 & 048080/ 080-GG & JG	2-1/2	27	24	15	0	0	0
		3	41	39	37	35	33	31
	048100 & 060100/ 100-JG & LG	2-1/2	8	0	0	0	0	0
		3	39	37	30	26	19	16
		4	40	39	37	35	33	31
	060120/120-LG	3†	19	12	10	7	0	0
		3*†	19	17	15	13	11	9
		4	34	32	30	28	19	17
		4*	45	43	42	40	39	37
8001 to 9000	030040/040-FG	2	17	15	13	11	9	0
	036040/040-GG	1-1/2	6	0	0	0	0	0
		2	36	34	32	30	28	25
	036060/060-GG	2	24	22	19	17	10	8
		2-1/2	36	34	32	30	28	26
	036080 & 048080/ 080-GG & JG	2-1/2	24	21	13	0	0	0
		3	36	34	32	30	28	26
	048100 & 060100/ 100-JG & LG	2-1/2	6	0	0	0	0	0
		3	35	33	26	23	16	13
		4	36	34	32	30	28	26
	060120/120-LG	3†	17	10	8	5	0	0
		3*†	17	15	13	11	9	7
		4	30	28	26	24	16	14
		4*	36	34	32	30	28	26
9001 to 10,000	030040/040-FG	2	15	12	10	7	5	0
	036040/040-GG	2	32	29	26	23	20	19
	036060/060-GG	2	21	18	15	13	5	0
		2-1/2	32	29	26	23	20	17
	036080 & 048080/ 080-GG & JG	2-1/2	21	18	10	0	0	0
		3	32	29	26	23	20	17
	048100 & 060100/ 100-JG & LG	3	31	29	21	18	11	8
		4	32	29	26	23	20	17
	060120/120-LG	3†	15	7	5	0	0	0
		3*†	15	12	10	7	5	0
		4	26	24	21	19	11	8
		4*	32	29	26	23	20	17

*Remove one combustion-air disk for this application.
†Long radius elbows must be used for this application.

NOTES:

1. Size both the combustion-air and vent pipe independently, then use the larger diameter for both pipes.
2. Assume two 45° elbows equal one 90° elbow. Long radius elbows are desirable and may be required in some cases.
3. Elbows and pipe sections within the furnace casing and at the vent termination should not be included in vent length or elbow count.
4. The installer may use one larger pipe size than what is specified above (up to 4 in. diameter maximum).
5. The minimum pipe length is 5 ft for all applications except for the 036080 & 048080/080-GG & JG models which have a 10 ft minimum pipe length.
6. Use 3-in. diameter vent termination kit for installations requiring 4-in. diameter pipe.

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